

26 (12) in the middle of the afternoon. A female captured on May 24, 11:30 A. M., and confined in the laboratory, and another one mating with a male, captured at 5 P. M., May 26, and similarly confined deposited eggs as follows:

Female No. 1 (Male Present).			Female No. 2 (Male Present).		
Date of Oviposition.	No. of Eggs.		Date of Oviposition	No. of Eggs.	
6 P. M., May 24	15		P. M., June 1	19	
2 " " 26	16		" " 5	11	
1:30 " June 1	26		" " 8	18	
4 " " 4	10		" " 9	12	
June 7	15		10 A. M., 10	16	
P. M., 9	14		" 11	20	
11	16		" 16	6	
			" 19	1	
	Total 112			Total 103	

Female No. 1 died at about noon, June 21. The second pair died on June 22; they were observed mating on May 30, June 4, 5, 9, 10 and 12.

The eight adults emerging June 21-23 (Table II) were confined together in a large glass jar and supplied abundantly with food. They did not begin to mate until June 28, when one pair was observed; another pair was observed mating on July 5, and both of them were isolated. The first pair produced 37 eggs and then escaped on July 8. They mated again on July 2 and 7. The second pair produced no eggs and died for lack of food about July 12. They had mated a second time on July 6.

**Class I, HEXAPODA.**

**Order IV, DIPTERA.**

**DESCRIPTIONS OF NEW MOSQUITOES FROM THE PANAMA CANAL ZONE.**

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Our knowledge of the mosquito fauna of the Isthmus of Panama has heretofore amounted to practically nothing, but thanks to the collections recently made by Mr. August Busck, is now decidedly improved. Mr. Busck went to the Isthmus at the invitation of Dr. W.

C. Gorgas of the Isthmian Canal Commission and through the courtesy of the Department of Agriculture especially to investigate the mosquitoes of that region. We are especially indebted to Dr. Herman Canfield of the Department of Sanitation of the Canal Zone, through whose initiative and interest the present investigation has resulted. A full list of the species collected will be made by Mr. Busck. Only the new ones are referred to here.

**Anopheles gorgasi, new species.**

Palpi as long as the proboscis, mostly black scaled, the terminal and penultimate joints light scaled except at the bases and apices; mesothorax gray, with fine brown scales, a black spot in front of the scutellum, a pair of sublateral black spots medially; wings with the veins scaled in black and white, two very large black patches on the costa and a smaller one towards the base and a smaller one at the apex as in *A. albimanus* Wied. The rest of the wing is too much denuded to describe. Abdomen with groups of outstanding scales laterally at the apices of the segments, the dorsum clothed with yellow scales on a dark ground, the lateral tufts black. Legs mostly black-scaled, hind legs with the apical half of the second, the third, and the base of the fourth joints white scaled, the remainder of the fourth and basal half of the fifth segments black, the third joint with a large black patch on the under side which reaches from near the base to beyond the middle. Length, 3.5 mm.

One female, in poor condition, La Boca, Canal Zone, Panama (A. H. Jennings, collector).

*Type*. — No. 10863, U. S. National Museum.

Named, at the suggestion of Mr. August Busck, in honor of Dr. W. C. Gorgas, Assistant Surgeon-General, U. S. Army, Chief Sanitary Officer of the Isthmian Canal Commission.

**Anopheles malefactor, new species.**

♀. — Palpi long, clothed with brown scales and black outstanding ones, which are grouped more or less in tufts, heaviest on the basal portion, a slight sprinkling of lighter scales among the brown ones, particularly at the bases of the dark tufts; occiput black scaled, the eyes margined with white above and where they join is a tuft of white hairs; mesonotum gray with reddish and bluish tinge and small dark freckles tending to form longitudinal rows, sparsely distributed narrow yellowish scales, a black spot at the base extending over the middle of the scutellum and two small sublateral black spots medially, all three of these show a lighter margin; abdomen slender, gray, with lateral tufts of outstanding black scales at the apices of the segments; legs with the femora and tibiae black freckled with white, on the hind tibiae yellow scales predominate; tarsi black, ringed with yellowish white; on the hind legs the first tarsal joint is dark at the base, light at the apex and has six white rings of different lengths, second joint narrowly white at base, broadly so at apex, with a moderately broad white ring near the middle and another narrower one between it and the base, third and fourth joints white ringed at base and apex with a broad central white ring, apical segment entirely whitish scaled; wing spotted, black and white,

a large black patch margined with white on the costa near the middle, more basally a smaller costal patch and towards the apex another large one, all margined with white, scaling of the veins in patches of black and white scales, the third vein with a small black spot at the base, the sixth vein with many black dots and dashes. Length, 4.5 mm.

♂. — Palpi with the apical portion clubbed, clothed with yellow scales with golden luster, a narrow dark ring at the middle of the club, the shaft ringed with dull ochreous at the apex and at the constriction and broadly marked with the same color on the apical portion; antennæ pale brown and ferruginous with silky luster. Length, 4.5 mm.

Seven specimens, Chagres River, Panama (August Busck, collector); Tabernilla, Canal Zone, Panama (August Busck, collector); Gatun, Canal Zone, Panama (A. H. Jennings, collector).

*Type*. — No. 10877, U. S. National Museum.

There is some variation in the banding of the hind tarsi. In two specimens the penultimate and apical white rings of the second joint are united; in one the apical white ring of the first joint is divided by a black bar, in another the penultimate ring is so divided, while in a third, the apical, penultimate, antepenultimate and another white ring are so divided, this specimen having eleven white rings on this joint instead of seven as in the type.

#### ***Mansonia phyllozoa*, new species.**

♂. — Proboscis moderately long and stout, slightly swollen towards the apex, black scaled, a yellow-white ring behind the middle; palpi nearly as long as the proboscis, black scaled with two yellow-white rings, the apices brilliantly silver scaled; mesonotum very deep brown with four longitudinal lines of silvery-white scales, two of these lines are marginal and extend the entire length of the mesonotum, the other two submedian and begin behind the middle and extend over the scutellum where they unite upon its hind margin; the lateral stripes extend along the sides of the scutellum; metanotum with a median carina, dark brown. Abdomen dark scaled with lateral patches of whitish scales. Legs with the femora predominately yellow scaled, the apices black; tibiæ yellowish-white scaled, ringed with black, the rings becoming larger towards the apices, first tarsal joints black, maculate with white; on the hind legs the apices broadly white, the second tarsal joint white at the apex and nearly half its base, the third joint broadly white at the base, minutely at the apex, the fourth more narrowly white at the base, the fifth entirely white-scaled; fore and mid legs narrowly white marked. Wings with the veins mostly black scaled; four conspicuous yellowish-white elongated costal spots one of these basal and very long, the others shorter, all involving the first vein. Length, 3 mm.

One specimen, Tabernilla, Canal Zone, Panama (August Busck, collector), bred from larvæ in the leaves of Bromelias.

*Type*. — No. 10864, U. S. National Museum.

***Deinocerites melanophylum*, new variety.**

A local race of *Deinocerites cancer* Theobald, differing by its very dark, almost black color; the clypeus and tori, which in the type form are yellow or yellowish brown, are here dark brown; the mesonotum is pitchy brown, the scales black with brownish luster, the metanotum is pitchy brown, nearly black; the abdomen is black-scaled above and beneath; in the male with blue and green iridescence. The legs are black.

Nine specimens, Colon, Canal Zone, Panama (August Busck, collector), from larvæ in crab-holes near the ocean.

*Type*. — No. 10865, U. S. National Museum.

***Uranotænia calosomata*, new species.**

Proboscis moderately long and slender, slightly enlarged apically; clypeus and tori dull brown; occiput brown scaled with two oblique lines of white scales, which converge upon the vertex and terminate in a white tuft; thorax deep brown, on the lateral margin a line of white scales to the base of the wing; pleura brown with a longitudinal stripe of white scales extending forward over the prothoracic lobe and joining the stripe on the head; metanotum brown. Abdomen black scaled at the sides, above clothed with ochreous yellow dull metallic scales, leaving a narrow black line at the base of each segment, becoming broader on the terminal segments, and a sub-basal median black spot; beneath with black vestiture and apical white bands, which are broadest on the centers of the segments. Legs black with bronzy and brassy luster, the apices of the femora white; on the hind legs the dilated apices of the tibiæ have a patch of white scales; hind tarsi with the third, fourth and fifth joints white with metallic luster. Wings heavily dark-brown scaled on the costa, the basal third of the first vein white scaled, the two forked cells small but broad, the second posterior cell slightly longer than the second marginal cell. Length, 2.5 mm.

Five specimens, Tabernilla, Canal Zone, Panama (August Busck, collector), bred from larvæ in prints of horses' feet containing water.

*Type*. — No. 10866, U. S. National Museum.

***Uranotænia typhlosomata*, new species.**

♂. — Proboscis long and slender, much swollen at the apex, black scaled; antennæ amply plumose; palpi very short, black scaled; occiput black scaled, the margins of the eyes broadly bluish-white scaled; mesonotum brown, with minute dark-brown scales; scutellum with metallic-blue scales, the setæ long, black; in front of the roots of the wings is a short stripe of silvery-blue scales and a similar blue stripe extending over the anterior half of the pleura and over the prothoracic lobes; metanotum dark brown; abdomen depressed, black scaled above and at the sides; legs black with bronzy luster, the knees with a minute silvery spot and at the apices of the hind tibiæ another; on the hind tarsi the apical three fifths of the third and all of the fourth and fifth joints silvery white; wings black scaled along the costa, brown scaled on the veins, the base of the first vein with a patch of silvery scales, the fifth vein with a line of silvery scales close to the base. Length, 2 mm.

One specimen, Taboga Island, Panama (A. H. Jennings, collector), bred from larvæ from pool in a small stream.

*Type*. — No. 10918, U. S. National Museum.

In the single specimen the thorax is somewhat denuded and it is possible that there may be a blue spot before the antescutellar space.

***Aedes lithæceter*, new species.**

♀. — Proboscis moderately long, rather slender, black scaled; palpi short, black scaled; occiput clothed with pale-yellowish scales, narrow curved ones on the vertex, flat ones on the sides, a small black patch on the lower part of the side; mesonotum with the anterior two-thirds clothed with shining light-yellow scales, a dark patch in front of the sides, posterior portion varied with blackish and pale-yellow scales, a patch at the side separated by a yellow stripe running from the middle to the base of the wing; scutellum yellow scaled; pleura dark with patches of white scales; mesonotum deep brown, nude; abdomen black-scaled above with median basal elongate creamy spots on all the segments, which however do not unite to form a stripe, segments with lateral triangular basal white patches, beneath the abdomen is mostly creamy white with black apical lateral triangular marks; legs black, knees yellow scaled, tarsi with narrow yellowish-white basal rings, the ring at the base of the second tarsal of the hind legs slightly involves the apex of the first joint; fork-cells rather short, scales of the veins all dark; claws of front and mid legs toothed, of hind legs simple. Length, 5 mm.

♂. — Palpi slightly shorter than the proboscis, hairy on the apical portion, the two apical segments light ringed at their bases; abdomen with distinct basal white bands on the second to fourth segments, on the succeeding segments broken into three spots, the median spot becoming elongate on the sixth and seventh segments, lateral cilia abundant, pale. Length, 4 mm.

Five specimens, Chagres River, Panama (August Busck, collector), bred from larvæ in pot-holes along the river.

*Type*. — No. 10868, U. S. National Museum.

Apparently nearly allied to *Danielsia tripunctata* Theobald and to *Danielsia mediomaculata* Theobald, the abdominal marking differing from the former and the thoracic marking differing from the latter. We would place *Danielsia* Theobald as a synonym of *Aedes* in our classification.

***Culex jubillator*, new species.**

♀. — Proboscis rather long and slender, not swollen towards the apex, clothed with black scales, not ringed; palpi short, black scaled; occiput clothed with narrow yellowish scales, margin of the eyes narrowly white, the upright forked scales brown with yellow luster; mesonotum light brown with golden luster; pleura pale gray; abdomen subcylindrical, truncate at apex, black scaled above with faint bronzy luster, segments 2 to 7 with a median basal triangular spot of white scales, the spots on the posterior segments smaller, eighth segment with a white basal band, which is laterally enlarged, a row of white lateral spots, ventral area white scaled; legs black with

bronzy luster, the tarsi with very narrow yellowish-white rings at both ends of the joints, last joint of hind tarsi narrowly whitish tipped; claws simple; scales of the wing-veins brown, long and narrow. Length, 3 mm.

♂. — Palpi considerably longer than the proboscis, the apical half with numerous long brown hairs, wholly brown scaled, without rings; antennæ strongly plumose; abdomen slender, depressed, dark-scaled above with faint bronzy luster, the segments with silvery-white basal bands which are produced triangularly in the middle, eighth segment entirely white scaled. Length, 3.5 mm.

Sixteen specimens, Taboga Island, Panama (A. H. Jennings, collector), bred from larvæ in water in old tubs in a pasture near the bathing beach.

*Type.* — No. 10916, U. S. National Museum.

The larva is very close to that of *Culex carmodyæ* Dyar & Knab, but has the pecten of the air-tube longer.

#### **Culex revelator, new species.**

♀. — Proboscis rather long and slender, not swollen at apex, brown scaled, not ringed; palpi short, black scaled; occiput brown scaled, ocular margin white; metanotum golden-brown scaled, pleura pale greenish gray; abdomen subdepressed, truncate at the tip, clothed above with black scales with bronzy and blue luster, the second and third segments with a median, basal, small patch of white scales, the succeeding segments banded, the bands broadest at middle, much narrowed at the sides, on the banded segments the bands are broadened laterally towards the ventral area; beneath entirely white scaled; legs dark with bronzy luster, the tarsi narrowly ringed with yellow-white at both ends of the joints; the tip of the last joint of the hind tarsi white; claws simple; wing scales brown, long and narrow. Length, 3 mm.

♂. — Palpi considerably longer than the proboscis, brown scaled with bronzy and bluish luster, the apical half with numerous long blackish hairs; antennæ amply plumose; abdomen long and slender, the segments with moderately broad basal silvery-white bands, those on the sixth and seventh segments dilated at the sides. Lateral cilia long, moderately abundant, pale brown. Length, 3.5 mm.

Four specimens, Taboga Island, Panama (A. H. Jennings, collector), bred from larvæ found in a boat containing water.

*Type.* — No. 10917, U. S. National Museum.

The larva is allied to *Culex proclamator* D. & K. and *C. inquisitor* D. & K., but differs from both in having the basal tuft of the tube well within the pecten.

#### **Culex leprincei, new species.**

♀. — Proboscis moderately long and slender, enlarged towards the apex, entirely black scaled; palpi short, black scaled; occiput clothed with flat bronzy scales and with black erect forked ones, without white ocular margin; mesonotum clothed with deep bronzy brown scales with faint indications of two lighter longitudinal dorsal lines; scutellum bronzy scaled; metanotum deep pitchy brown; abdomen broad,



flattened, truncate at tip, black scaled above with faint bronzy luster, the bases of the segments with lateral white triangular spots, the marginal hairs light yellow, beneath the segments are black with broad white basal bands; legs dark with bronzy luster, the knees and tips of tibiae lighter colored, tarsi not ringed, claws simple; wing scales brown. Length, 3.5 mm.

♂.—Palpi about one-fourth longer than the proboscis, the two last segments very hairy, clothed entirely with deep brown scales with bronzy luster; antennæ densely plumose; lateral spots of the abdomen large on segments 5, 6 and 7, the lateral cilia coarse, moderately abundant with yellowish luster. Length, 3 mm.

Sixteen specimens, Tabernilla and Pedro Miguel, Canal Zone, Panama (August Busck, collector), bred from larvæ in a stagnant ill-smelling pool and among grass in the edge of a slowly running stream.

*Type*.—No. 10869, U. S. National Museum.

Named, at the suggestion of Mr. Busck, in honor of Dr. J. A. LePrince, Chief Sanitary Inspector of the Canal Zone.

#### ***Culex corrigani*, new species.**

♀.—Proboscis long and slender, distinctly swollen at the apex, black scaled, not ringed; palpi very short, brown scaled; occiput brown scaled, the eyes with distinct white margins; mesonotum rather light-brown scaled, with a darker shade on the posterior portion and with many long coarse black bristles; metanotum very light brown; pleura pale greenish; abdomen somewhat depressed, truncate at the tip, clothed above and at the sides with black scales with a brownish luster, beneath greenish-white scaled along the median line; legs black with bronzy luster, claws simple; scales of the wing-veins brown, long and narrow. Length, 3 mm.

One specimen, Tabernilla, Canal Zone, Panama (August Busck, collector), bred from larvæ in water in bamboo joints.

*Type*.—No. 10870, U. S. National Museum.

Named, at the suggestion of Mr. Busck, in honor of Mr. John Corrigan, Sanitary Inspector of Tabernilla.

The larva is allied to that of *Culex conservator* Dyar & Knab, but differs in the long slender antennæ on which the tuft is placed very near the apex, and in having six single hairs on the air-tube.

#### ***Culex equivocator*, new species.**

♀.—Proboscis rather long and slender, very slightly enlarged towards the apex, black scaled; palpi short, black scaled; occiput brown scaled with bronzy luster, the ocular margin very narrowly white scaled; mesonotum uniformly rich brown scaled with bronzy luster; metanotum light brownish; abdomen depressed, truncate at the tip, clothed above with brownish-black scales with faint bluish luster, the segments with lateral white triangular basal spots, most distinct on segments 5, 6 and 7, beneath black, the bases of the segments with broad soiled white bands; legs dark with bronzy luster; claws equal and simple; scales of the wing-veins brown, long and narrow throughout. Length, 3.5 mm.

♂. — Palpi longer than the proboscis, the two terminal segments with long hairs, entirely clothed with deep-brown scales, without pale rings; abdomen with narrow white basal segmental bands above, the eighth segment entirely white scaled. Length, 3.5 mm.

Eight specimens, Tabernilla, Canal Zone, Panama (August Busck, collector), bred from larvæ in water in bamboo joints.

*Type*. — No. 10873, U. S. National Museum.

Allied to *C. hesitator* D. & K., described below, but differing in the shape of the wing-scales.

***Culex jenningsi*, new species.**

♀. — Proboscis moderately long and slender, not swollen towards the apex, clothed with black scales, not ringed; palpi short, black scaled; occiput clothed with dark scales and lighter ones intermixed, margin of the eyes white scaled; mesonotum clothed with dark-brown scales with bronzy luster with several faintly indicated longitudinal ridges; metanotum dull brown; abdomen depressed, truncate at the tip, clothed with black scales which show a bronzy luster in some lights, the second, third and fourth segments have white basal bands, on the succeeding segments these are represented only by triangular lateral spots, a dark-blue metallic reflection at the tip of each segment, beneath the abdomen is dark scaled with distinct white basal bands; legs black with bronzy luster, the knees and apices of the tibiæ on the hind legs silvery white, hind tarsi narrowly ringed with silvery white at the bases; pleura pale greenish with two blackish longitudinal stripes; claws simple; veins of the wings brown scaled, the scales long and narrow. Length, 3 mm.

♂. — Palpi long and very slender, slightly longer than the proboscis, the apices blunt, black scaled without white rings; antennæ densely plumose; abdomen with narrow silvery-white basal bands on all the segments. Length, 3 mm.

Four specimens, Tabernilla, Canal Zone, Panama (August Busck, collector), bred from larvæ in water in the leaves of Bromelias.

*Type*. — No. 10867, U. S. National Museum.

Allied to *Culex consolator* Dyar & Knab.

Named, at the suggestion of Mr. Busck, in honor of Mr. A. H. Jennings, Special Sanitary Inspector of the Canal Zone.

***Culex gaudeator*, new variety.**

♀. — Proboscis moderately long and slender, enlarged at the apex; palpi short, black scaled; occiput clothed with flat silver-gray scales and with numerous upright forked ones, mesonotum deep-brown scaled, on the anterior half a broad marginal yellowish stripe which curves inward at the middle; the posterior end of the stripe may form a detached dot or the whole marking may be absent; antescutellar bare space surrounded by light-colored scales, the light markings show a brassy or silvery luster in changing lights; scutellum silvery scaled; pleura light brown with patches of white scales; metanotum deep pitchy brown; abdomen depressed, truncate at apex, clothed above with black scales, at the sides with distinct basal triangular white patches, beneath black with broad white basal segmental bands; legs dark with



bronzy luster, the knees capped with silvery, hind tibiæ with a large silvery spot at the apex, tarsi narrowly ringed with silvery white at the bases of the joints, the last joint of the hind tarsi dark on the apical two thirds; claws simple; scales of the wing-veins brown. Length, 3 mm.

♂. — Palpi long and very slender, nearly as long as the proboscis, black scaled without white rings; abdomen dark scaled with distinct bronzy luster and with narrow basal segmentary white bands, which become dilated at the sides, beneath uniformly silvery white, except the extreme apex. Length, 2.5 mm.

Seven specimens, Tabernilla, Canal Zone, Panama (August Busck, collector), bred from larvæ in water in the leaves of Bromelias.

*Type.* — No. 10871, U. S. National Museum.

Nearly allied to *Culex imitator* Theobald, but the thoracic markings less silvery and the tarsal bandings narrower.

We describe this form as a variety of *Culex jenningsi* Dyar & Knab, in which the thorax is ornamented. The basal abdominal bands of *jenningsi* are lost in this form, but may be seen under the microscope as 3 or 4 scales at the bases of the segments. The white rings on the tarsi are of a different width.

The larva is closely similar to that of *Culex rejector* Dyar & Knab, unbred, found in Bromelias at Cordoba, Mexico. It is possible that the species is the same, but we await the receipt of adults from Mexico before a final decision.

#### **Culex hesitator, new species.**

♀. — Proboscis moderately long, very slightly broadened towards apex, black scaled; palpi short, black; occiput clothed with recumbent whitish scales and with erect black forked ones; mesonotum uniformly rich brown with slight bronzy luster; pleura very pale brownish with an indistinct dark longitudinal shade; metanotum pale grayish brown; abdomen depressed, truncate at the tip, black scaled above with coppery and greenish luster, marginal hairs of the segments pale yellow, lateral white basal spots present, those on the terminal segments largest, venter black, with distinct white basal bands; legs dark with bronzy luster; wing-veins uniformly brown scaled; claws simple. Length, 3 mm.

♂. — Palpi much longer than the proboscis, the last two segments projecting beyond it, brown scaled, not ringed; antennæ densely plumose; abdomen with basal silvery-white bands above, broadest on the fourth and fifth segments and much prolonged on the sides on the sixth and seventh segments. Length, 3.5 mm.

Seven specimens, Las Cacadas, Canal Zone, Panama (August Busck, collector), bred from pupæ captured in a small swampy stream.

*Type.* — No. 10872, U. S. National Museum.

Allied to *Culex extricator* Dyar and Knab, but the banding of the abdomen beneath differs.

***Joblotia trichorryes*, new species.**

♀. — Form elongate-slender, the abdomen compressed; proboscis shorter than the body, rather stout, and slightly enlarged towards the apex. Clypeus prominent, luteous brown, with a row of fine hairs along each side, none in front nor on the upper surface. Palpi short, rather slender, about one fourth the length of the proboscis; tori yellow-brown; antennæ with whorls of long hairs; occiput clothed with flat iridescent blue and green scales, brilliant silvery in some lights; hind margin with a row of erect dark scales; prothoracic lobes large and prominent, well separated, clothed with brilliant silvery scales; mesothorax somewhat compressed, clothed with dusky scales, pleura ochreous yellow, with patches of silvery scales; scutellum clothed with broad flat metallic blue-green scales; metanotum with three longitudinal impressions, a group of coarse terminal hairs; abdomen obliquely truncate at the tip, clothed above with dusky scales, which show metallic-green and steel-blue reflections; beneath silvery white, encroaching on the lateral area as rounded segmentary incisions. Wings long and narrow, hyaline, the scales of the veins dusky. Legs long, slender, without raised scales, black, with metallic violet and blue reflections, the tarsi of the middle legs with the last four joints brilliant white, the hind legs with the outer half of the third and the last two joints white. Claws simple. Length, 5.5 mm.

♂. — Proboscis shorter than in the female, more distinctly swollen at the tip; palpi long, nearly as long as the proboscis, very slender; antennæ rather sparsely plumose; abdomen much compressed; claspers stout, rather small; no lateral fringe. Length, 5.5 mm.

Thirty-six specimens, Tabernilla, Canal Zone, Panama (August Busck, collector), bred from larvæ in bamboo joints. The larva resembles that of *Joblotia digitatus* Rondani, but has the mandibles long and slender. In some of the adults there is a little of black on the last joint of the middle legs.

*Type*. — No. 10847, U. S. National Museum.

***Joblotia mogilasia*, new species.**

♀. — Form stouter than the preceding species; proboscis shorter than the body, gradually enlarged towards the apex. Clypeus brown, prominent, with a fringe of small hairs mixed with a few scale-like hairs at the sides, nude on the upper surface. Palpi short and slender, about one fourth the length of the proboscis. Occiput clothed with flattened dusky scales with an obscure metallic blue and green luster; prothoracic lobes large and prominent, well separated and clothed with silvery scales, mesonotum dusky scaled, with an obscure bluish luster; pleura ochreous yellow, covered with silvery scales; scutellum covered with large, flat, broad, bright metallic blue-green scales; metanotum dusky brown with two longitudinal impressions and a group of coarse bristles near the apex; abdomen dusky above with metallic blue and green reflections, truncate at the tip, beneath yellowish white with an undulate margin at the sides; wings long and narrow, the scales of the veins dusky; legs long, moderately slender, without distinct raised scales, dark, with blue and violet luster, the hind tibiae are white marked at the base; the last four joints of the middle tarsi are bright white, extreme tip black, on the hind tarsi the apical half of the third and the fourth and fifth joints white. Length, 6 mm.

Three specimens, Tabernilla, Canal Zone, Panama (August Busck, collector), bred from larvæ in bamboo joints. The larva resembles that of *Joblotia digitatus* Rondani (= *nivipes* Theob.).

*Type*. — No. 10848, U. S. National Museum.

**Lesticocampa culicivora, new species.**

♀. — Proboscis long and slender; palpi not as long as three joints of the antennæ, slender, black; clypeus black, shining, nude; occiput clothed with flat deep blue scales; prothoracic lobes large, prominent, well separated, with a few silvery scales; mesothorax compressed, covered with steel-blue scales; scutellum clothed with flat broad shining bright-blue scales; metanotum deep brown, a group of setæ towards the apex; abdomen long and slender, subcylindrical, the segments somewhat constricted beneath, above clothed with steel-blue scales, beneath with yellowish silvery ones with an undulate lateral margin; wings long and narrow, hyaline, the cross-veins nearly incident; legs long and slender, the hind legs with outstanding scales on the apical portion of the tibiæ and particularly on the second joint of the tarsi; forming a short lateral fringe; black with violet-blue reflection, the tarsi of the middle legs with the apical half of the second and the succeeding segments silvery white, of the hind legs with the last two joints white. Length, 5 mm.

One specimen, Tabernilla, Canal Zone, Panama (August Busck, collector), bred from larvæ in flowers of *Heliconia*, associated with some unbred long-tubed larvæ, probably a species of *Culex*.

*Type*. — No. 10849, U. S. National Museum.

**Sabethes canfieldi, new species.**

♀. — Proboscis shorter than the body, strongly swollen at the apex, black; clypeus prominent, smooth, shining black; tori of the antennæ black with a whitish pubescence; occiput clothed with flat dull metallic-green scales; prothoracic lobes approximated, clothed with brilliant blue and violet scales; mesonotum clothed with dark greenish scales; scales of the scutellum metallic green and blue; metanotum deep brown, with a number of long pale bristles; abdomen dark above, with greenish-blue luster, silvery white beneath, separated on the sides in a perfectly straight line; legs long and slender, without raised scales, black, with light bronzy reflections beneath in certain lights, the tarsi of the middle legs white on the second to fifth joints, the white becoming obscure on the basal part of the second segment, on the hind legs the last two joints white. Length, 3.5 mm.

Twenty-three specimens, Lion Hill, Canal Zone, Panama (August Busck, collector), all captured.

*Type*. — No. 10850, U. S. National Museum.

Named, at the suggestion of Mr. Busck, in honor of Dr. Herman Canfield, Assistant Chief Sanitary Inspector of the Canal Zone.

**Sabethes identicus, new species.**

♀. — Identical with *Sabethes undosus* Coq.; we are unable to demonstrate any differences whatever between the adults.

Four specimens, Tabernilla, Canal Zone, Panama (August Busck, collector), bred from larvæ in bamboo joints.

*Type*. — No. 10851, U. S. National Museum.

The larvæ are allied to those of *Sabethes undosus*, but differ in many particulars, so that a distinct species is indicated, in spite of the apparent identity of the adults. The air-tube is short, without any basal enlargement and but two pairs of single hairs; the body hairs are finer, less coarsely stellate; the dorsal hooks of the seventh segment with a tooth instead of simple; maxillæ less stout with seven small teeth instead of four large coarse ones.

***Sabethes undosus* Coquillett.**

A large series of bred specimens was obtained by Mr. Busck from larvæ in bamboo joints, the larvæ agreeing with those figured by us under this name. The genus *Sabethinus* Lutz is apparently synonymous with *Sabethes*, and his species *Sabethinus aurescens* with *Sabethes undosus*. We are unable to determine at present which specific name has priority.

***Sabethoides* Theobald.**

We suppressed this genus as a synonym of *Sabethes*, but it can be recognized therefrom by the long slender proboscis, not swollen at the tip. The prothoracic lobes are approximate, but not absolutely contiguous. Lutz and Theobald place this genus under the heading "palpi short in both sexes," but apparently neither of these authors has seen a male. We have a single male of *Sabethoides cyaneus* Fab. (= *confusus* Theob.) in which the palpi are nearly as long as the proboscis. (They are broken, but the end of the long joint reaches to the middle of the proboscis.)

***Phoniomyia chrysomus*, new species.**

♂. — Proboscis long and slender, black; occiput dark scaled, a small silvery spot on the vertex; prothoracic lobes prominent, clothed with shining coppery scales; mesonotum and scutellum clothed with dark scales with faint greenish and bronzy luster, setæ of scutellum dark; metanotum deep brown with a group of setæ; abdomen black above with faint bluish sheen, beneath silvery white, the colors separated in a straight line; legs dark, with brassy reflection beneath, the mid legs with the third and fourth tarsal joints and the apex of the second silvery white at the side. Length, 2.5 mm.

One specimen, Tabernilla, Canal Zone, Panama (August Busck, collector), bred from larvæ in water in leaves of Bromelias.

*Type*. — No. 10854, U. S. National Museum.

**Phioniomyia scotinomus, new species.**

♂. — Proboscis long and slender, very slightly enlarged towards the apex, black; palpi very short; clypeus yellow-brown; occiput dark scaled, the vertex and dividing line of the eyes obscurely silvery; prothoracic lobes prominent, approximated, clothed with dark scales with a blue and violet luster; mesonotum clothed with dark-brown scales with slight bronzy luster, faintly greenish in certain lights; scales of the scutellum like those of the mesonotum; setæ of the scutellum dark; metanotum deep brown with a group of setæ towards the apex; abdomen black scaled above, with faint bluish luster, beneath lustrous whitish, the colors separated in a straight line on the sides, apex of the abdomen dilated; legs dark scaled above, beneath brassy, the middle legs silvery beneath on the third and fourth joints, hind legs silvery beneath on the last joint. Length, 3 mm.

♀. — Similar to the male.

Three specimens, Boqueron River, Panama, and Tabernilla, Canal Zone, Panama (August Busck, collector), bred from larvæ in water in the leaves of Bromelias.

*Type*. — No. 10855, U. S. National Museum.

**Phioniomyia philophone, new species.**

Proboscis long and slender, nearly as long as the body, very slightly enlarged towards the apex; clypeus prominent, pitchy brown, covered with fine gray pubescence; tori of the antennæ black with fine silvery pubescence; occiput behind the eyes broadly silver scaled; palpi very short, black; vertex with green and blue iridescent scales; antennal segments long, the whorls of hairs consist of a few long ones, and being well removed from each other do not give a densely plumose appearance; prothoracic lobes large, prominent, collar-like, closely approximate but not contiguous, clothed with violet and blue metallic scales and with many coarse bristles on the front margin; mesonotum rather short, stout, clothed with dark olivaceous and green scales; metanotum short, globose, with two longitudinal impressions, pitchy brown, a group of setæ beyond the middle; abdomen long and slender, compressed, clothed above with blackish scales with an obscure greenish luster, beneath with white scales, divided on the sides in a straight line; legs long and slender, dark brown with bronzy luster, a whitish reflection on the front tarsi. Length, 3 mm.

Twenty specimens, Tabernilla, Canal Zone, Panama (August Busck, collector), bred from larvæ in leaves of Bromelias.

*Type*. — No. 10852, U. S. National Museum.

**Wyeomyia codiocampa, new species.**

♀. — Proboscis rather short and stout, thickened towards the apex, black scaled; clypeus large, globose, brown with minute gray pubescence; palpi very short, black scaled; eyes divided by a narrow white-scaled strip; occiput clothed with brownish iridescent scales, the ocular margin narrowly white and forming a triangular patch between the eyes; prothoracic lobes large, prominent, well separated, the basal portion silvery white, tip also white, the central portion blackish brown; mesonotum short, convex, clothed with bronzy brown scales; setæ of the scutellum ferruginous

yellow; metanotum pitchy black with a group of setæ towards the apex; abdomen rather stout, compressed, truncate at the tip with numerous terminal coarse bristles, black scaled above, creamy white beneath, the white forming deep lateral incisions at the apices of the segments; legs dark, with bronzy luster, the fore legs pale brassy beneath throughout their length, mid legs with the apical portion of the second, the third and fourth joints silvery white beneath, hind legs with the second and third joints silvery white beneath, the fourth and fifth bronzy brown. Length, 4 mm.

♂. — Antennæ shorter than in the female, the hairs of the whorls more numerous; palpi very short, white scaled; abdomen strongly compressed along the anterior two thirds, the apex dilated, with lateral and ventral groups of coarse bristles; front legs with the third and fourth joints silvery white beneath, the middle and hind legs light brassy beneath, on the mid legs becoming silvery white on the third and fourth joints, on the hind legs the apical half of the first, the second, third and basal part of the fourth joints silvery white beneath. Length, 4.5 mm.

Eleven specimens, Tabernilla, Canal Zone, Panama (August Busck, collector), part of the specimens bred from larvæ in bamboo joints, the others caught in a bamboo woods.

*Type.* — No. 10853, U. S. National Museum.

#### ***Wyeomyia panamena*, new species.**

Proboscis moderately stout, enlarged towards the apex; palpi short, silvery scaled at the apex; clypeus prominent, brown, with fine whitish pubescence; tori yellow with fine silvery pubescence; occiput entirely dark scaled with faint iridescence, white on the lower part of the side; prothoracic lobes large and prominent, well separated, clothed with blackish scales, a patch of whitish ones at the apices, the lower portion whitish scaled; mesonotum and scutellum clothed with brownish scales with bronzy and bluish luster; metanotum pitchy black, with a group of setæ near the apex; abdomen compressed, black scaled above, white beneath, the colors separated in a straight line on the sides; legs entirely dark with metallic luster, beneath the legs are bright bronzy. Length, 4 mm.

One specimen, Tabernilla, Canal Zone, Panama (August Busck, collector), bred from a pupa in a bamboo joint.

*Type.* — No. 10856, U. S. National Museum.

#### ***Wyeomyia circumcincta*, new species.**

♂. — Proboscis moderate, much dilated at the tip, black; palpi very short, dark scaled; occiput dark scaled with bluish iridescence, eyes narrowly margined with white; prothoracic lobes prominent, well separated, clothed with dark scales which have at the tip a violaceous coppery metallic sheen; mesonotum dark scaled, with bronzy and obscure bluish reflections, the front margin distinctly whitish scaled; scutellum clothed like the mesothorax; metanotum pitchy black, with a group of setæ near the apex; abdomen black above with blue and bronzy luster, creamy white beneath, the colors separated in a straight line on the sides; legs dark above with bronzy luster, beneath mostly with a light brassy whitish sheen, on the middle legs the apical half of the second and all of the succeeding joints completely encircled



with silvery white; the brassy color of the under surface is interrupted beneath by a dark shade on the first and second tarsal joints, the fore femora are mostly bronzy beneath on the apical half. Length, 3 mm.

Two specimens, Tabernilla, Canal Zone, Panama (August Busck, collector), bred from larvæ in the water in leaves of Bromelias.

*Type*. — No. 10857, U. S. National Museum.

**Wyeomyia agnostips, new species.**

Proboscis rather slender, distinctly swollen towards the tip, black scaled; palpi short, black scaled; clypeus prominent, black; occiput dark scaled, with blue and green iridescence, the eyes not margined by pale, a small silvery spot at the vertex, at the sides and beneath bright silvery; prothoracic lobes large and prominent, well separated, clothed with shining coppery scales, which become violaceous on the sides; pleura silver scaled; mesonotum clothed with brown scales, with slight metallic luster, basally and on the scutellum with faint greenish reflection, setæ at the bases of the wings and on the scutellum golden yellow; metanotum pitchy brown with a bluish bloom, a group of setæ towards the apex; abdomen compressed, clothed above with black scales with greenish luster, beneath with creamy white shining vesture, the colors separated in a straight line on the sides; legs dark, brassy beneath, the middle pair with the apical three fourths of the second joint and all the succeeding joints silvery white on the inner side, hind legs with the fourth and fifth tarsal joints white on the inner side. Length, 4.5 mm.

One specimen, Tabernilla, Canal Zone, Panama (August Busck, collector), captured in bamboo woods.

*Type*. — No. 10858, U. S. National Museum.

**Wyeomyia homothe, new species.**

Proboscis long and slender, distinctly swollen at the apex; palpi very short, dark scaled, a few light scales at the tip; clypeus and tori light brown with fine grayish pubescence; wedge between the eyes broad, silvery scaled; occiput entirely dark scaled, the eyes without margin of light scales; prothoracic lobes large and prominent, well separated, clothed with brown scales with violet reflection, the apices broadly silvery as also the base below; mesonotum clothed with dull-brown scales, the setæ of the scutellum brown; metanotum pitchy brown, with a group of setæ towards the apex; abdomen compressed, black scaled above with greenish luster, extending well down the sides, the venter narrowly creamy-white scaled; legs long and slender, dark with bronzy luster, the mid legs with the third, fourth and fifth tarsal joints marked with white on the inner side, rather indistinct and only clearly visible in certain lights; scales of the wing-veins long and narrow. Length, 3 mm.

One specimen, Tabernilla, Canal Zone, Panama (August Busck, collector), captured in bamboo woods.

*Type*. — No. 10859, U. S. National Museum.

**Wyeomyia hosautus, new species.**

Proboscis rather short and stout, enlarged towards the apex, black scaled; palpi short, black scaled; clypeus prominent, black with fine grayish pubescence; the

wedge between the eyes covered with silvery scales; occiput entirely dark scaled with blue and green iridescence, no pale margin to the eyes; prothoracic lobes large and prominent, well separated, clothed with dark scales, the apex silvery scaled as also the base below; mesonotum and scutellum clothed with brownish and blackish scales which show a bluish luster, setæ of the scutellum brown; metanotum deep brown with a group of setæ towards the apex; abdomen compressed, black scaled above, beneath creamy white, the colors separated in a straight line on the sides; legs dark with metallic luster, brassy beneath, the middle legs with the tip of the second and the succeeding joints silvery white on the inner side; wings with the scales of the veins short and broad on the outer half. Length, 3.5 mm.

One specimen, Tabernilla, Canal Zone, Panama (August Busck, collector), bred from a pupa found in a bamboo joint.

*Type.* — No. 10860, U. S. National Museum.

***Wyeomyia leucopisthepus*, new species.**

Proboscis rather long and slender, swollen at the apex; palpi very short, black scaled; occiput dark scaled, with blue-green luster, the eyes evenly white margined, a small white spot on the vertex; prothoracic lobes large and prominent, well separated, clothed with dark scales, the apices and bases silvery scaled; mesonotum brown scaled, in front with a few whitish scales; metanotum blackish with a group of setæ towards the apex; abdomen black scaled above, white scaled beneath, the colors separated in a straight line on the sides; legs dark with bronzy luster, brassy beneath, on the hind legs the fourth and fifth tarsal joints are silvery-white scaled on the inner side except at their apices which are dark scaled; scales of the wing-veins long and narrow. Length, 2.5 mm.

One specimen, Tabernilla, Canal Zone, Panama (August Busck, collector), bred from larvæ in water in the leaves of Bromelias.

*Type.* — No. 10861, U. S. National Museum.

***Wyeomyia macrotus*, new species.**

Proboscis rather long and slender, swollen at the apex, black scaled; palpi short, black scaled; clypeus prominent, black, with fine grayish pubescence; occiput dark scaled with bluish luster, a metallic spot on the vertex, no white margin to the eyes; prothoracic lobes large and prominent, well separated, blackish scaled, the tips and basal part white in certain lights and connected behind by a whitish band; mesonotum brown scaled, with faint bronzy and blue reflections, the hairs of the scutellum dark; metanotum dark brown with a few setæ near the apex; abdomen dark scaled above with bronzy and bluish luster, beneath creamy white, the colors separated in a straight line on the sides; legs moderately slender, dark with bronzy luster, brassy beneath; scales of the wing-veins mostly short and broad, a few longer ones in the region of the cross-veins. Length, 3 mm.

Three specimens, Boqueron River, Panama, and Tabernilla, Canal Zone, Panama (August Busck, collector), bred from larvæ in the water in the leaves of Bromelias. The pupa has remarkably long breathing tubes.

*Type.* — No. 10862, U. S. National Museum.